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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,020	03/31/2004	Munisamy Anandan	OLIT1100	9155
7590 06/15/2005			EXAMINER	
Dr. M. Anandan 13009 Thome Valley Dr. Del Valle, TX 78617			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/815,020	Applicant(s) ANANDAN ET AL.	
	Examiner Mike Qi	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15 is/are rejected.
- 7) ☒ Claim(s) 13, 14, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 60/461,098.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 13, 14, 16 and 17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim ("multiple dependent claim") refers to more than one other claims shall refer to such other claims in the alternative only. See MPEP § 608.01(n). Claim 14 is dependent on claim 13, so that the claim 14 has the deficiency set forth above. Claim 16, recitation "... as claimed in claims 1 through 29 and ...", but the total claims is 17. Claim 17, recitation "... as claimed in claims 1 through 17 and ...", how claim 17 is dependent on claim 17. Accordingly, the claims 13, 14, 16 and 17 have not been further treated on the merits.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,241,339 (Ushiyama) in view of US 5,693,962 (Shi et al).

Claims 1-3, Ushiyama discloses (col.5, line 14 – col.10, line 15;Figs.3-7)

that a color change liquid crystal assembly comprising:

- a first liquid crystal display cell (27) as a monochrome LCD without color filter;

- a second liquid crystal display cell (28) utilizing the GH (guest-host) effect containing liquid crystal (25) and dye molecules (26) as a dichroic cell in which the dye molecules (26) absorb light having a certain wavelength; and when voltages are impressed across the display cells, the incident light of a certain wavelength is absorbed, so that the color is determined by a combination of the second display cell (28) (as a dichroic cell) utilizing GH effect and colored polarizing plate (16) disposed on the lower portion of the display device, so that a desired color display is obtained; such that the second display cell (28) functions as a dichroic cell and a voltage dependent color absorption medium;
- the first liquid crystal cell displays information with a background color supplied by the second cell (28) (dichroic cell);
- because the color absorption is determined by the voltage applied, so that when the voltage is programmed and related to the information, the display on the LCD screen would be corresponding to the programmed voltages, and the first display cell (27) (monochrome LCD) would exhibit the background color as applied by the second cell (28) (dichroic cell).

Ushiyama does not explicitly disclose that using white light emitting backlight as light source and externally connecting the LCD, the dichroic cell and the backlight device to their source voltage.

However, Shi discloses (col.1, lines 28 – 32) that using white emitter as a backlight to generate full color has been widely used in full color liquid crystal display.

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As a general available knowledge, using backlight would enhance the display brightness. Therefore, emitting a full color light, the backlight should be a white light emitting backlight, and disposed in the rear side of the device, so that bounding the LCD, the dichroic cell and the backlight together to form an integrated device. Ushiyama shows (Fig.3) that the source voltage is supplied externally. Therefore, when using backlight device disposed under the dichroic cell, the source voltage would be externally connected to the LCD, the dichroic cell and the back light device as using external connecting would simplifying the manufacturing process. Therefore, if the monochrome LCD (such as a first liquid crystal display cell) removed, the resulting assembly would be used as color changeable backlight assembly, and the dichroic cell also can be an electrically controlled birefringence liquid crystal cell such as guest-host liquid crystal cell using guest-host effect as taught by Ushiyama.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use dichroic cell having guest-host effect and the color absorbing is controlled by a programmed voltage to change the background color for the information display and using white light emitting backlight as claimed in claims 1-3 in order to generate a full color (white light) and enhance the brightness of the display, so as to control the light absorbing and capable to change the color display.

Claim 5, Ushiyama discloses (col.1, lines 40-66) that the display device includes the first display cell, the second cell. . . and the n^{th} display cell, and the liquid crystal material in the second to the n^{th} display cell is of the guest-host type (dichroic dye cell). That would be more than one of the dichoric cell so as to form the assembly.

Claim 8, lacking limitation is such that the monochrome LCD, the dichroic cell and the backlight device are intimately placed in contact with each other.

However, when assembly the system, the skilled in the art must place the number of module together such as the monochrome LCD, the dichroic cell and the backlight device and are intimately placed in contact with each other. Otherwise, the system would not be assembled as a whole unitary device, and that would have been at least obvious.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ushiyama and Shi as applied to claims 1-3, 5 and 8 above, and further in view of US 5,965,907 (Huang et al).

Claim 15, Ushiyama discloses (col.5, line 14 – col.10, line 15;Figs.3-7) that a color change liquid crystal assembly comprising:

- the first display cell (27) having a top substrate (17) and bottom substrate (18);
- the second cell (28) (dichroic cell) sharing the bottom substrate (18) with the first display cell (27) as its top substrate.

Lacking limitation is such that the backlight device sharing the bottom substrate of the dichroic cell as its top substrate, and bonded the display cell, dichroic cell and the backlight together through a perimeter seal to form an integrated assembly.

However, Huang discloses (col.4, lines 13 – 67;Fig.2) that a backlight device (50)

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which is a full color light (white light) emitting device (OLED) using panel (58) that sharing a substrate with the LCD (60), so as to form an integrated backlight module with a liquid crystal display which is relatively easy and inexpensive to manufacture.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a backlight device sharing substrate with dichroic cell as claimed in claim 15 for achieving a relatively easy and inexpensive to manufacture.

5. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ushiyama and Shi as applied to claims 1-3, 5 and 8 above, and further in view of US 4,978,951 (Knapp).

Claim 4, lacking limitation is such that using an electro-phoretic cell to replace the liquid crystal display.

However, Knapp discloses (col.1, lines 22-28) that other passive electro-optical media such as electro-phoretic material is used instead of the liquid crystal display element, and that is known in the art as all of them are passive electro-optical media and have similar effect.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to replace the liquid crystal display with an electro-phoretic cell as claimed in claim 4 as they have similar effect.

Claim 6, the assembly is used in cell phone that is only given weight as intended use, and that would have been at least obvious.

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6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ushiyama and Shi as applied to claims 1-3, 5 and 8 above, and further in view of US 6,504,588 B1 (Kaneko).

Claim 7, lacking limitation is such that the backlight device emits bands of wavelengths between 400 nm and 700 nm.

However, Kaneko discloses (col.16, lines 39-47;Figs.14-15) that as backlight (28) to emit white light, the emission spectrum is shown by a curved line (48) in Fig.14, the light in a wide range of wavelength from 400 nm to 700 nm emitted, so as to obtain a white light emitting.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use backlight device emits bands of wavelength between 400 nm and 700 nm (visible light) as claimed in claim 7 for achieving a white light emitting.

7. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ushiyama and Shi as applied to claims 1-3, 5 and 8 above, and further in view of US 6,804,037 B1 (Nito et al).

Claims 9-12, lacking limitation is such that the dichroic cell comprises LC molecules having positive dielectric anisotropy or negative dielectric anisotropy and a combination of positive and negative dichroic dye molecules.

However, Nito discloses (col.7, lines 53 – 59) that the guest-host liquid crystal (dichroic cell) used for the light modulation apparatus having host material (LC molecules) of negative or positive type liquid crystal having negative or positive dielectric anisotropy, and having guest material (dichroic dye molecules) of positive or

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negative type dichroic dye molecular material. The combination of positive and negative dichroic dye molecules would be an obvious variation. Kaneko also indicates (col.1, line 26 – col.2, line 10) that the positive type dichroic dye molecules capable of absorbing light in the alignment direction of major axes of the molecules, and the negative type dichroic dye molecules capable of absorbing light in the alignment direction of minor axes of the molecules, so that the effect of selectively control the light absorbing is obtained.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the dichroic cell comprises LC molecules having positive dielectric anisotropy or negative dielectric anisotropy and a combination of positive and negative dichroic dye molecules as claimed in claims 9-12 for achieving the effect of selectively control the light absorbing.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
June 1, 2005


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